

## **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in this application.

### **Listing of Claims**

1. (Currently Amended) A process for the reduction of boron trifluoride emissions from a crude PAO product stream, the process comprising the following sequential steps:  
oligomerizing a linear alpha olefin feed mixture by contacting the linear alpha olefin with a mixture comprising fresh boron trifluoride-organic catalyst, recovered boron trifluoride-organic catalyst, and boron trifluoride to form an oligomerization reaction mixture comprising free boron trifluoride gas, boron trifluoride-organic catalyst, unreacted alpha-olefin monomer, and poly-alpha olefin oligomers,  
mixing the oligomerization reaction mixture with an organic constituent selected from the group consisting of alcohols, alkyl acetates, alkyl carboxylic acids, ethers and mixtures thereof to yield a crude PAO product of boron trifluoride-organic catalyst, unreacted alpha-olefin monomer, and poly-alpha olefin oligomers,
  - a. distilling a portion of the crude PAO product ~~containing a boron trifluoride-organic catalyst~~ at a temperature sufficient to cause the boron trifluoride-organic catalyst to dissociate to produce an overhead stream comprising uncomplexed boron trifluoride and an uncomplexed organic catalyst component, and
  - b. contacting the uncomplexed boron trifluoride and uncomplexed organic catalyst component in a condenser column having an internal structure that increases the recombination of the uncomplexed boron trifluoride and uncomplexed organic catalyst component to form a recycle boron trifluoride-organic catalyst, wherein the recycle boron trifluoride-organic catalyst is about 30 % greater in saturation than the recycle boron trifluoride-organic catalyst recovered in the absence of the internal structure.
2. (Original) The process according to Claim 1, wherein the internal structure comprises a

structured packing material, baffles or a combination of a structured packing material and baffles.

3. (Original) The process according to Claim 2, wherein the internal structure comprises stainless steels, Monel, Hastelloy, nickel, titanium, plastic, ceramics or mixtures thereof.
4. (Original) The process according to Claim 1, wherein the loss of boron triflouride ranged from about 25 % to about 50 % less than the process without the internal structure.
5. (Original) The process according to Claim 4, wherein the recycle boron trifluoride-organic catalyst is from about 52 mole% to about 100 mole% saturated.
6. (Original) The process according to Claim 1, wherein the organic catalyst comprises an alcohol, an alkyl acetate, an alkyl carboxylic acid, an ether or mixtures thereof.
7. (Original) The process according to Claim 6, wherein the organic catalyst comprises butyl alcohol, butyl acetate, propanol, pentanol or mixtures thereof.
8. (Original) The process according to Claim 1, wherein crude PAO product is an oligomeric mixture formed from one or more linear alpha olefins, the linear alpha olefins having from about 6 to about 20 carbon atoms.
9. (Original) The process according to Claim 8, wherein the one or more linear alpha olefins have from about 8 to about 12 carbon atoms.
10. (Currently amended) The process according to Claim 1, wherein ~~the crude PAO in (a) further comprises a monomer of a linear alpha olefin oligomerized to form the crude PAO product stream and the overhead stream further comprises the unreacted alpha-olefin monomer; and wherein the contacting step (b) further comprises the monomer.~~

11. (Cancelled)

12. (Currently amended) The process according to ~~Claim 11~~Claim 1, further comprising the step of removing heat of formation of the boron trifluoride-organic catalyst by cooling a vapor-liquid mixture contacting the internal structure comprising the internal structure, wherein the internal structure comprises a structured packing material, baffles or a combination of a structured packing material and baffles.
13. (Currently amended) The process according to ~~Claim 11~~Claim 1, further comprising separating the recycle boron trifluoride-organic catalyst from the monomer and/or a dimer olefin overheads of the distillation column.
14. (Original) The process according to Claim 13, wherein the separation comprises a phase separation.
15. (Previously presented) The process according to Claim 1, wherein the temperature sufficient to cause the boron trifluoride-organic catalyst to dissociate is 220 °C.